

55138-55

ACCESSION NR: AP5012347

gallium potential, when the metal is broken in a gallate solution at 5°C. When the surface is renewed the electrode potential becomes more negative and then it returns gradually to the initial value. The most negative value of the potential corresponds to a clean, active, electrode surface and the gradual positive shift of the potential is a result of oxidation of the gallium surface. It was found that the stationary potential of liquid gallium coincides with the equilibrium potential. The potential shift for a solid gallium electrode is smallest when the oxide film on its surface is rapidly dissolved. This takes place when the concentration of alkali and temperature are high. The activation energy for reduction of gallium ions is ~3 kcal/mol. This activation energy was calculated taking equilibrium potential into account and does not change with a change in polarization. Orig. art. has: 4 figures and 2 tables.

ASSOCIATION: Institut fizicheskoy khimii Akademii nauk SSSR (Institute of Physical Chemistry, Academy of Sciences, SSSR)

SUBMITTED: 24Jul64

ENCL: 01

SUB CODE: EM, IC

NO REF SOV: 001

OTHER: 001

Card 2/3

L 55138-55

ACCESSION NR: AP5012347

ENCLOSURE: 01

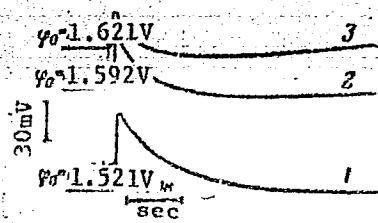


Fig. 1. Change in potential of the gallium electrode when it is broken at different concentrations of KOH.

1--11.8; 2--60; 3--145 g/l;
conc. of Ga = 45 g/l

Card 3/3

LEZHAVA, T.I.; VAGRAMYAN, A.T.

Passivation of the surface of liquid and solid gallium in the
process of electrodeposition. Elektrokhimiia 1 no.3:321-325
Mr '65. (MIRA 18:12)

1. Institut fizicheskoy khimii AN SSSR.

LEZHAVA, V.

Contemporary geomorphological processes of the upper Iora Basin
(up to the village Udzharma) [in Georgian with summary in Russian].
Trudy Tbil. GU no.62:211-222 '57. (MIRA 11:7)

1. Tbilisskiy gosudarstvennyy universitet imeni Stalina, kafedra
geomorfologii.
(Iora Valley--Geology, Structural)

LEZHAVA, V.M.

Mudflow (Gvartsioni) along the right bank of the Alazani River
from the Headwaters to the Vantis-Khevi River. Truly Geog. ob-va
Gruz. SSR no.3:101-114 '58. (MIRA 12:9)
(Alazani Valley--Landslides)

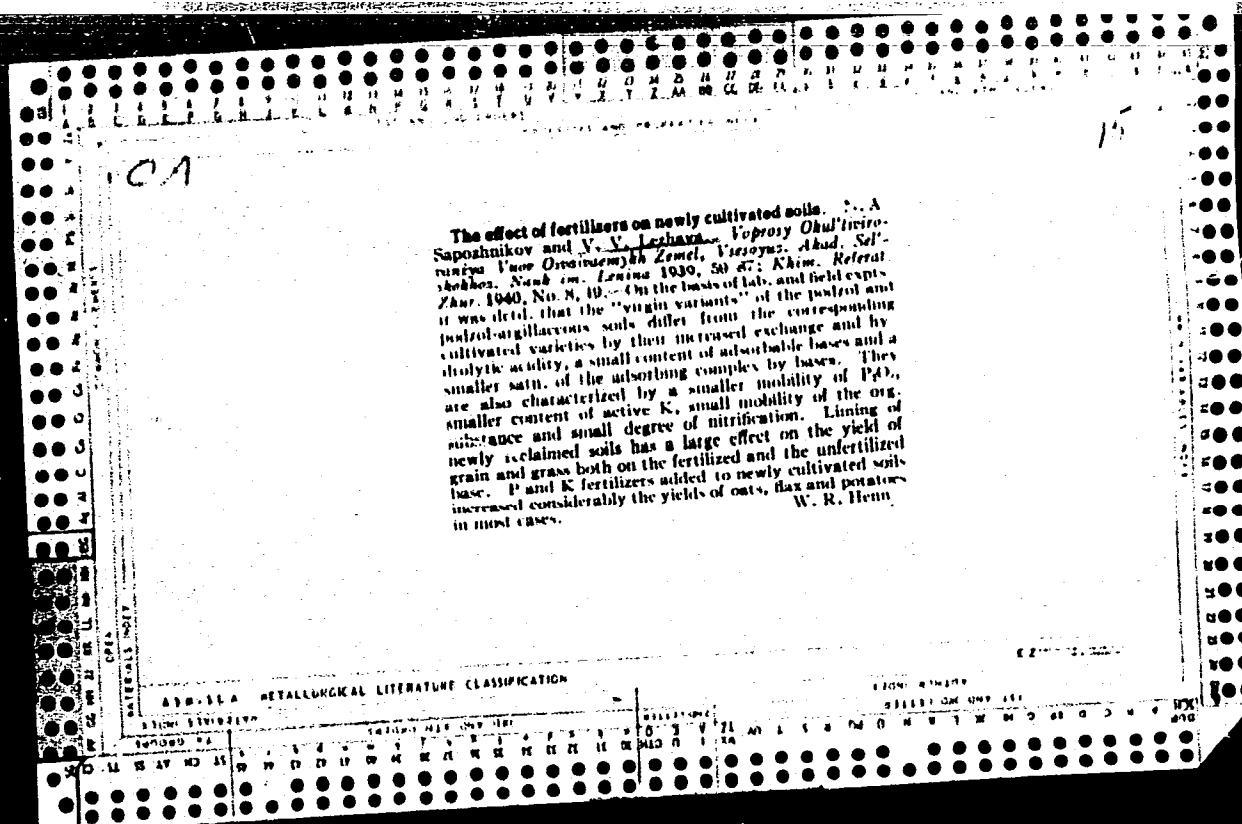
ASTAKHOV, N.Ye.; LEZHAVA, V.M.

River robbery in the lower reaches of the Tezani River
(Georgian S.S.R.) Trudy Geog.ob-va Gruz.SSR 4:93-99 '59.
(MIRA 13:1)

(Tezani River--Geology. Structural)

LEZHAVA, V.M.

Mid flows in the basin of the Lapiani-Khevi River; the left-
banktributary of the Iori River. Trudy Geog.ob-va Gruz.SSR
4:101-108 '59. (MIRA 13:1)
(Lapiani--Khevi River--Alluvium)



CA

Defecation sludge as local fertilizer. A. D. Menagarishvili and V. Y. Iskhakova. *Trudy Inst. Pochvovedeniya, Akad. Nauk Gruzinskoi S.S.R.* 3, 127-35 (1970) (Georgic with Russian summary). — Defecation sludge was a good fertilizer for sugar beet and corn. It increased the yield of both considerably as compared to the yield from untreated fields. The effectiveness of the sludge as fertilizer is diminished when used together with mineral fertilizer. M. Hosh

CA

Effectiveness of using trace elements on vineyards. A.
D. Menagarishvili and V. V. Lezhaya, (Inst. Soil Sci.,
Agrichem. Melioration, Acad. Sci. Georgian S.S.R.),
Vinodelie i Vinogradarstvo S.S.S.R. 10, No. 6, 16-17
(1960). — Results of exps. over 3 years with 1-2 kg./hec-
tare B and 3-6 kg./hectare Mg added to fertilizer showed a
high efficiency for the microelements (I) as compared with
N-P-K fertilized and unfertilized controls in increasing the
harvest, particularly when grown on carbonate-contg. soil.
I produced no change in the fruit. II. Outfield

MENAGARISHVILI, A.D.; LEZHAVA, V.V.

Filter-press waste as fertilizer in beet cultures. Soobshcheniya Akad. Nauk
Gruzin. S.S.R. 11, No.1, 17-22 '50.
(CA 47 no.21:11629 '53)

1. LEZHAVA, V. V.
2. USSR (600)
4. Viticulture
7. Effectiveness of mineral fertilizers for the grape vine. Soob. AN Gruz. SSR 11 No. 6, 1950.
9. Monthly List of Russian Accessions, Library of Congress, April 1953, Uncl.

Country : USSR
Category: Cultivated Plants. Grains.

M

Abs Jour: RZhBiol., No 22, 1958, No 100219

Author : Lezhava, V.V.
Inst : ~~Soil Science~~ Inst., AS Georgian SSR
Title : Materials on the Study of the Effect of Granular
Superphosphate on the Yield of Winter Wheat.

Orig Pub: Tr. In-ta pochvoyed. AN GruzSSR, 1957, 8, 161-169.

Abstract: In 1952-1954, on the carbonate alluvial-meadow soils of Kartalinskaya plain and on weakly podzolic soils of Imeretiya, experiments were conducted on the study of the effectiveness of applying under winter wheat the granular P_c in comparison with the powdered, and also with

Card : 1/2

Card : 2/2

M-14

LEZHEBRUKH, G. O.

Lezhebrukh, G. O. - "The fundamentals of the technological system of carding." In the symposium: Nauch.-issled. trudy (Nauch.-issled. in-t sherst. prom-sti), Moscow-Leningrad, 1949, p. 5-29, - Bibliog: 5 items

SO: U-4934, 29 Oct 53, (Letopis 'Zhurnal 'nykh Statey, No. 16, 1949).

LEZHNEVICH, G.O., kandidat tekhnicheskikh nauk; KONONENKO, T.V., inzhener.

Efficient technology in processing staple fiber in fine-comb
spinning of wool. Tekst.prom.16 no.4:27-31 Ap '56. (MIRA 9:7)
(Woolen and worsted spinning)

LEZHEBRUKH, G.O., kand.tekhn.nauk

Carding conditions and formation of the return layer on the
mountings of the carding drum. Nauch.-issl.trudy TSNWISherstl.
no.18:10-26 '63. (MIRA 18:1)

LEZHEBRUKH, G.O., kand.tekhn.nauk; CHUYKOVA, N.I., inzh.

Automatic control of silver weight on roving machines. . . Tekst.
prom. 19 no.2:25-31 F '59. (MIRA 12:5)
(Spinning machinery) (Automatic control)

LEZHEBRUKH, G.O., kand.tekhn.nauk

Effect of some parameters of the carding process on its results.
Tekst.prom. 20 no.8:27-29 Ag '60. (MIRA 13:9)
(Carding)

LEZHEBRUKH, G.O., kand.tekhn.nauk

Detecting defective spindles and reducing yarn breakage in woolen manufacture. Tekst.prom. 22 no.1:35-40 Ja '62. (MIRA 15:2)

1. Rukovoditel' pryadil'noy laboratorii TSentral'nogo nauchno-issledovatel'skogo instituta shersti.
(Woolen and worsted spinning)

L 22785-66 EWT(1) IJP(c) WW/GG
 ACC NR: AP6007630 SOURCE CODE: UR/0141/66/009/001/0057/0060
 AUTHOR: Gracheva, M. Ye.; Lezhen, A. S. 31
 29
 B
 ORG: Institute of the Physics of Atmosphere, AN SSSR (Institut fiziki atmosfery AN SSSR)
 TITLE: Fluctuation of intensity of light propagating in a medium with variable turbulence characteristics
 SOURCE: IVUZ. Radiofizika, v. 9, no. 1, 1966, 57-60
 TOPIC TAGS: light propagation, atmospheric turbulence
 ABSTRACT: ^{21, 44, 55} Light propagation is considered for a case when the source and the receiver are placed at 1 m and 70 m above the Earth's surface, respectively; the slanted path length, 600 m; zenith angle, 84° ; unstable stratification of the atmosphere and free convection conditions are considered. For uniform turbulence conditions, the mean square of fluctuation of the logarithm of intensity of a planar monochromatic wave is given by: $\sigma_0^2 = 1,23 C_n^2 k^{7/6} L^{11/6}$, where $k = 2\pi/\lambda$, L is the wave path, and C_n^2 is the "structural constant": $C_n^2(z) = C_n^2(z_n) (z/z_n)^{-\alpha}$, where z_n is a fixed

Card 1/2 UDC: 535.3:551.51

L 22785-66

ACC NR: AP6007630

2

level, α is equal to $2/3$ for dynamic turbulence or $4/3$ for free convection. The veracity of the above formulas was checked by experiments staged in the summer of 1964 in a flat steppe terrain. Light flicker was measured along with mean temperatures and wind velocities; also, Richardson numbers were calculated from gradient measurements. A "satisfactory" agreement between theoretical and experimental results is reported. In conclusion, the authors wish to thank V. I. Tatarskiy and A. S. Gurvich for the direction of the project and valuable advice. Orig. art. has: 2 figures and 5 formulas. [03]

SUB CODE: 08, 20 / SUBM DATE: 31May65 / ORIG REF: 005 / OTH REF: 001
ATD PRESS: 4/229

Card 2/2 *del*

LEZHEN, M.O.

Setting up simple universal electric meters in electrotechnical practical work. Politekh.obuch. no.4:32-33 Ap '57. (MIRA 10:7)

1. Shkola No. 2 g. Yenakiyevo Stalinskoy oblasti.
(Electric meters)

GERMAN, E.D.; RAYEVSKIY, A.B.; LEZHENIN, V.M.

Inhibition of emulsion polymerization. Vysokom. soed. 5
no.10:1496-1498 0 '63. (MIRA 17:1)

1. Voronezhskiy filial nauchno-issledovatel'skogo instituta
sinteticheskogo kauchuka imeni S.V. Lebedeva.

ANTIPOV, L.A., inzh.; LEZHEPEKOV, B.S., inzh.; STAVTSEV, B.N., inzh.

Selection of parameters for working units of a motor grader.
Stroi i dor. mash. 8 no.12:4-5 D'63 (MIRA 17:7)

FEDORV, Ye.P., inzh; ANTIPOV, L.A., inzh; LEZHEPEKOV, B.S., inzh.
SOKOLOV, L.V., inzh.

New self-propelled graders from the Orlov factory. Stroi. 1
dor. mash. 6 no.5:4-7 My '61. (MIRA 14:6)
(Graders (Earthmoving machinery))

ANTIPOV, L.A., inzh.; LEZHEPEKOV, B.S., inzh.; STAVTSEV, B.N., inzh.;
FEDOROV, Ye.P., inzh.

Improving the design of motor graders at the Orlov Factory.
Stroi.i dor.mash. 7 no.2:7-9 F '62. (MIRA 15:5)
(Graders (Earthmoving machinery))

LEZHEFEKOV, Ivan Petrovich.

LEZHEFEKOV, Ivan Petrovich. Hemp makes the wealth of our collective farm. Moskva, Gos.
izd-vo sel'khoz. lit-ry, 1954. 45 p. (Peredovoi opyt v sel'skom khoziaistve)
(55-19501)

SB255.L45

LEZHEPEKOV, F.F.

Traffic safety, aesthetic appearance of road installations,
and established standards for the design. Avt.dor. 28
no.10:19-20 0 '65. (MIRA 18:11)

LEZHEPEKOVA, L.N.

The problem of mental diseases in influenzal encephalitis, Vop.
psikh i nevr. no.3:19-26 '58. (MIRA 12:3)

1. Iz II Leningradskoy psikhonevrologicheskoy bol'nitsy.
(ENCEPHALITIS) (INFLUENZA)
(PSYCHOSES)

LEZNEPEKOV, F.F., inzh.

Bituminous and tar emulsions in Czechoslovakian road construction.
Avt. dor. 24 no.7:28 J1 '61. (MIRA 14:7)
(Czechoslovakia--Road materials)

SOV/120-59-4-47/50

AUTHORS: Goldobin, A. N., Lezheyko, L. V.

TITLE: A Device for Electrolytic Sharpening of Point Probes with Control of the Quality of the Point

PERIODICAL: Pribery i tekhnika eksperimenta, 1959, Nr 4, pp 156-157 (USSR)

ABSTRACT: The authors describe a variant of the electrolytic method of sharpening point probes. A device is used which sharpens a probe by periodic immersion of the latter into an electrolyte and removal of the probe from the electrolyte at a controlled rate. This rate depends on the diameter of the original rod or wire and the rate of dissolution of the probe material by the electrolyte. The device makes it possible to produce rapidly point probes with the quality of the point controlled continuously by means of a binocular magnifier or a binocular microscope MBS. Alternatively, the point may be projected on a screen and its quality judged from its magnified image. The device is shown schematically in Fig 1, and its photograph is given in Fig 2 (numbering of details in both figures is the same). Five support rods are fixed to an ebonite base 1. Four of the support rods (2 and 3) are used to mount the main part of the device and one such rod 4 carries a small lamp 13. A d.c. motor 6 with

Card 1/3

SOV/120-59-4-47/50

A Device for Electrolytic Sharpening of Point Probes with Control of the Quality of the Point

a worm reductor 7 rotates a crankshaft mechanism 12 . The crankshaft and a small roller 11 convert the rotation of the motor shaft into a vertical up-and-down motion of a rod 9 which carries a clamp 23 to hold the probe. The electrolyte is placed in a beaker 22 on a moveable table 21 . The motor is supplied through a potentiometer (or a rheostat), which is used to alter the rate of rotation of the motor shaft and thus the rate of the up-and-down motion of the probe. D.c. current is supplied through terminals (15 in Fig 2) to the electrolyte and the probe; this current is also controlled by means of a potentiometer. A binocular magnifier 17 or a microscope has its own stand separate from the device itself. When wires of 0.5 mm diameter and thinner have to be sharpened into probes, the rate of up-and-down motion produced by the motor may be too small; for this purpose the device can be used without the reductor 7 and the motor 6 - the crankshaft is then rotated manually by means of a knob 20 . The following parameters can be varied in this device: (a) the electrolyte composition and density, (b) the current density through the electrolyte

Card 2/3

SOV/120-59-4-47/50

A Device for Electrolytic Sharpening of Point Probes with Control of the Quality of the Point

and the probe, (c) the rate of immersion of the probe into the electrolyte and the rate of its removal from the electrolyte. The rates of immersion and removal determine the duration of action of the electrolyte on various parts of the probe point. The device can be used to produce uniform symmetrical cone-shaped probes of any metal and to improve the quality of probes already sharpened or to reduce the probe dimensions. There are 2 figures and 3 references, 2 of which are English and 1 German.

ASSOCIATION: Institut poluprovodnikov AN SSSR (Institute for Semiconductors, Academy of Sciences, USSR)

SUBMITTED: July 14, 1958.

Card 3/3

29704

S/181/61/003/010/036/036
B125/B102

24.2800(1145, 1153, 1160, 1142)

AUTHORS: Goldobin, A. N., Lezheyko, L. V., and Sharnopol'skaya, Ye. T.

TITLE: Piezoelectric resistance in tellurium

PERIODICAL: Fizika tverdogo tela, v. 3, no. 10, 1961, 3247 - 3249

TEXT: A study was made of the change in resistance when monocrystalline tellurium specimens of different concentrations were subjected to uniaxial elongation between 77 and 450°K. The specimens had been previously annealed in order to obtain an ordered structure. In this way, the temperature dependence of the piezoelectric resistance was unified to some extent. Present data refer to the constant $\pi_{33} = \Delta Q/QZ$ of piezoelectric resistance (current and stress Z are directed along the trigonal crystal axis). $\pi_{33} = f(\frac{1}{T})$ is almost linear in the region of impurity conductivity, and displays the characteristic deep minimum when passing to the region of intrinsic conduction. This temperature dependence was measured for an impurity concentration $N_A = 2 \cdot 10^{15} \text{ cm}^{-3}$. The constant of the piezoelectric

Card 1/4

29704
S/181/61/003/010/036/036
B125/B102

Piezoelectric resistance in...

resistance depends greatly on the impurity concentration. The highest piezoelectric resistance is observed in the region of intrinsic conduction, and may be qualitatively described by a change of lattice parameters and by the narrowing of the forbidden band. As a consequence, the number of carriers excited by thermal motion also changes. Under these premises, the following holds:

$$\frac{d \ln \rho}{dZ} = \frac{\epsilon}{2kT} \left(\frac{a-1}{a} \right) \left(\frac{1 + \mu_p/\mu_n}{\frac{a-1}{a+1} + \frac{\mu_p}{\mu_n}} \right), \text{ where } a = (1 + (4np/N_A^2))^{-1/2}. \quad (2) \text{ was}$$

derived under the premise that μ_p/μ_n remains constant under load.

$d \ln \rho / dZ \rightarrow \epsilon / 2kT$ holds at high temperatures ($np > N_A^2$, $a \gg 1$). Under these conditions, the pressure dependence of the forbidden band width is given by

$\epsilon = (3.5 \pm 0.1) \cdot 10^{-11} \text{ ev} \cdot \text{cm}^2 / \text{dyne}$ for specimens of different concentrations. The change of resistance in the case of uniform pressure has the same sign as in the case of elongation. This is explained by the existence of crossed atomic chains in the tellurium crystal structure. In the impurity region (in tellurium, where already at 77°K impurities are ionized), the
Card 2/4

29704

S/181/61/003/01G/036/036
B125/B102

Piezoelectric resistance in...

carrier concentration cannot be affected by a change of the band width. In addition, an elongation by which no new impurity centers are produced can change only the hole-mobility tensor. The experimentally observed dependence of π_{33} on N_A has not been sufficiently clarified so far. To acquire a complete knowledge of the nature of the piezoelectric resistance in the impurity region, it is necessary to study the effect of elongation on the Hall effect and on other parameters of T_e in this region. The high piezoelectric resistance between - 20 and + 200°C is a point in favor of the usability of tellurium crystals for constructing strain gages. A. R. Regel' is thanked for discussions. There are 1 figure and 4 references: 1 Soviet and 3 non-Soviet. The three references to English-language publications read as follows: P. W. Bridgman, Proc. Amer. Acad. Sci., 72, 159, 1938; J. Bardeen, Phys. Rev., 75, 11, 1777, 1949; J. D. Long, P. Li. Amer. Bull. of the Amer. Phys. Soc., 1, 1958; J. S. Blakemore, K. C. Heaps, Phys. Rev., 117, 687, 1960.

ASSOCIATION: Institut poluprovodnikov AN SSSR Leningrad (Institute of Semiconductors of the AS USSR Leningrad) ✓

Card 3/4

Piezoelectric resistance in...

29704
S/181/61/003/010/036/036
B125/B102

SUBMITTED: June 28, 1961

X

Card 4/4

L 17727-66

ACC NR: AT6001332

SOURCE CODE: UR/0000/65/000/000/0064/0073

EWT(1)/EWT(m)/EEC(k)-2/ETC(f)/EWG(m)/EWP(t) IJP(c) RDW/JD/GS

AUTHOR: Goldobin, A. N.; Lezheyko, L. V.

ORG: *none*

TITLE: Temperature dependence of the piezoelectric effect in tellurium ^{21, 44, 55} *27*

SOURCE: AN AzerbSSR. Institut fiziki. Selen, tellur i ikh primeneniye (Selenium, tellurium and their utilization). Baku, Izd-vo AN AzerbSSR, 1965, 64-73

TOPIC TAGS: tellurium, piezoelectric modulus, temperature dependence, electric conductivity, tensor analysis, metal physics, piezoelectric property

ABSTRACT: A theoretical and experimental analysis was made of the temperature dependence of the piezoelectric effect in tellurium in order to clarify the structure of the valence zone. The piezoelectric resistivity tensor (quarter rank) was given with eight independent parameters: π_{11} , π_{12} , π_{13} , π_{14} , π_{31} , π_{33} , π_{41} and π_{44} . A schematic diagram of the respective orientations (voltage-strain) necessary to determine these eight parameters is presented and methods for measuring these were described. A variable loading arrangement was used in measuring the voltage drop. The samples were cut, etched about 100 μ and annealed at 320°C for 30 hours. The

Card 1/2

L 17727-66

ACC NR: AT6001332

changes in the parameters were given as a function of temperature ranging from -100 to 200°C. The results varied considerably depending on the parameter and on the impurities which ranged from $5 \cdot 10^{14}$ to $8 \cdot 10^{16} \text{ cm}^{-3}$. In the temperature range of 77 to 200°K, a weak dependence was observed for some parameters in the region of impurity conductivity. Several relations are given for pn conductivity in terms of the effective density of states in the conductivity region and in the valence band and of the respective energies for these regions. These formulas satisfactorily explain the impurity and temperature dependence of the effect. The larger values obtained for μ_{33} and μ_{11} are explained in terms of the dependence of carrier mobility on effective mass for the particular lattice directions involved. Transducer applications of tellurium for conditions of deformation or vibration are recommended especially in the low temperature region since some coefficients exhibited such a weak dependence on temperature. Orig. art. has: 6 figures, 7 formulas.

SUB CODE: 11 20/ SUBM DATE: 10Mar65/ ORIG REF: 003/ OTH REF: 005

Card 2/2

LEZHEVKO, V. F.

"The History of the Discovery of Ohm's Law." Cand Phys-Math Sci,
Leningrad State Pedagogical Inst, Leningrad, 1953. (RZhFiz, Sep 54)

SO: Sum 432, 29 Mar 55

LEZHEYKO, V.F.

112-2-2588

Translation from: Referativnyy Zhurnal, Elektrotehnika, 1957, Nr 2,
p.1 (USSR)

AUTHOR: Lezheyko, V.F.

TITLE: The laws of the Electric Current Establish by V.V. Petrov
(O zakonomernostyakh elektricheskogo toka,
ustanovlennyykh V.V. Petrovym)

PERIODICAL: Uch. zap. Leningr. gos. ped. in-t, 1955, Nr 103,
pp. 305-309

ABSTRACT: Analyzing the work of the talented Russian scientist,
V.V. Petrov, published in 1803 under the title "News
of the Galvani-Volta Experiments", the author under-
scores the services rendered by V.V. Petrov as the first
Russian investigator in electricity and the founder of
national electrical metallurgy who, in his conceptions of
the electric current anticipated Oersted, Ampere and Ohm.
S.M.G.

Card 1/1

LEZHNEV A.G.

117-58-5-14/24

AUTHOR: Kurochkin, V.D., Chekmenev, V.F. and Lezhnev, A.G.

TITLE: Grinding of a Cutting Instrument by Means of a Multiple Thread Grinding Wheel (Shlifovaniye rez'bovogo instrumenta mnogotochnym shlifoval'nym krugom)

PERIODICAL: Mashinostroitel', 1958, Nr 5, pp 30-32 (USSR)

ABSTRACT: For the sake of economy and efficiency, the cutting of interior and exterior threads is being done at present on taps, gauges and multi-thread rollers by means of multiple-thread grinding wheels. In accordance with the new technology, thread-cutting instruments up to a pitch of 2 mm are cut with a multiple-thread grinding wheel. Grinding is done in two operations requiring 2 wheels. For the preliminary cut, a grinding wheel of a slightly softer metal is used as compared with that of the final grinding. Thread-cutting on taps M6x1, M8x1.25 and M10x1.5 is done in two passes and on taps M12x1.25, M12x1.75, M14x2, M16x1.5 and M16x2 in three passes (2 preliminary and 1 final). Grinding wheels are provided with multiple thread by means of rollers with annular thread. The rollers are made from carbon steel U8A, U10A and U12A. The rollers are subjected to a thermal

Card 1/2

117-58-5-14/24

Grinding of a Cutting Instrument by Means of a Multiple Thread Grinding Wheel

treatment to a hardness degree of $R_s = 58 - 62$. The rollers themselves in the course of production get a preliminary thread cut with a multiple thread grinding wheel and are finished with a single thread grinding wheel. For cutting annular thread, a special device on the adjusting plate of the screw cutting lathe is used. It serves to fix the required thread pitch (see figure 2). The rolling-on of thread on a multiple thread grinding wheel requires 15-20 minutes; the speed of rotation of the grinding wheel is thereby cut down to 1.8 m/sec. Efficiency in tap thread-cutting by means of multiple-thread grinding wheels has increased "more than twice". Figure 3 shows sets of thread-cutting instruments ground by this new method. There are 3 figures and 2 tables.

AVAILABLE: Library of Congress

Card 2/2 1. Cutting tools-Grinding processes

LEZHNER, V.K.; SERKOV, A.T.

Recovery of carbon disulfide during the formation of rayon cord
on PN-300-1 machines. Khim. volok. no.5:45-48 '65.

(MIRA 18:10)

1. Vsesoyuznyy nauchno-issledovatel'skiy institut iskusstvennogo
volokna (for Lezhnev). 2. Gosudarstvennyy komitet khimicheskoy
promyshlennosti pri Gosplane SSSR (for Serkov).

KRYLOV, B.R., inzh.; LEZHNEV, A.M., inzh.

Mechanized processing of oscillograms. Prom. energ. 18 no.9:
12-14 S '63. (MIRA 16:10)

KRYLOV, B.F., inzh.; LEZHNEV, A.P., inzh.

Voltage regulation in low-power 220-380 volt lines. Prom.
energ. 18 no.5:22 My '63. (MIRA 16:6)

(Electric power distribution)

LEZENEV, A.P., insh.

Using asynchronous couplings for regulating ventilators. Mekh. i
elek. sets. sel'khoz. 17 no.2:35-37 '59. (MIRA 12:6)

1. Leningradskiy sel'skokhozyaystvennyy institut.
(Farm, Electric)

KRYLOV, B.F.; LEZHNEV, A.P.

Automatic charging of materials on the sintering conveyer belt system. Biul. TSIICIM no.3:36-37 '61. (MIRA 14:12)

1. Cherepovetskiy metallurgicheskiy zavod.
(Sintering—Equipment and supplies)

LEZHNEV, A.V., inzh.

Use of a bitumen-latex emulsion and plastic concrete in supporting mine shafts. Shakht. stroi. 7 no.2:16-17 F '63. (MIRA 16:3)

1. Mikhaylovskiy uchastok Belgorodskogo shakhtostroyupravleniya tresta Shakhtspetsstroy.

(Mine timbering—Equipment and supplies) (Waterproofing)

ABRAMYAN, A., inzh. (Izhevsk); LEZHNEV, B., inzh. (Izhevsk); PESHEKHONOV, N.,
master sporta (Izhevsk)

From a road to a racing motorcycle. Za rul. 21 no.7:20 J1 '63.
(MIRA 16:8)
(Motorcycles)

LEZHNEV, D.A.

The crew works the communist way. Razved. i okh. nedr. 30 no.6:
56 Je '64. (MIRA 17:10)

1. Trest "Poltavaneftegazrazvedka".

LEZHNEV, E.I., inzh.

Calculation of the traction characteristics of electromagnets
with rotary armatures. Vest. elektroprom. 33 no.11:73-75 N
'62. (MIRA 15:11)

(Electromagnets)

LEZHNEV, G.

Strengthen the control of the Communal Bank over construction.
Fin. SSSR 16 no.1:61-63 Ja '55. (MLRA 7:12)

(White Russia--Construction industry--Finance)

(White Russia--Banks and banking)

S/058/61/000/008/043/044
A058/A101

24,180 0

AUTHORS: Berdyyev, A. A., Lezhnev, N. B.

TITLE: Investigation of absorption of ultrasonic waves at high frequencies

PERIODICAL: Referativnyy zhurnal, Fizika, no. 8, 1961, 348, abstract 8Zh587
("Izv. AN TurkmSSR. Ser. fiz.-tekhn. Khim. i geol. n", no. 6, 1960, 127-130)

TEXT: The authors describe the block diagram and electric circuit of a setup for measuring absorption of ultrasonic waves in liquids in the frequency range 5 - 200 Mc. On this setup one can measure the temperature dependences of the absorption and of the velocity. The measurement range for attenuation was 0.2 - 4,000 db/cm. The measurement error of ultrasonic absorption and velocity does not exceed 3% and 0.5%, respectively.

D. L.

[Abstracter's note: Complete translation]

Card 1/1

BERDYEV, A.A.; LEZHNEV, N.B.

Ultrasound absorption in benzene and thiophene at frequencies
under 300 mc. Izv.AN Turk.SSR.Ser.fiz.-tekh., khim.i geol.nauk
no.3:104-106 '63. (MIRA 17:3)

1. Fiziko-tekhnicheskiy institut AN Turkmenskoy SSR.

S/046/63/009/001/020/026
B104/B186

AUTHORS: Berdyev, A. A., Lezhnev, N. B.

TITLE: On the problem of ultrasound absorption measurements in liquids

PERIODICAL: Akusticheskiy zhurnal, v. 9, no. 1, 1963, 113 - 115

TEXT: In equipment commonly used for the measurement of ultrasound absorption in liquids, the attenuation in a sample is compared with gauge attenuation in an r-f attenuator. The subjective errors which may arise from comparing both signals on an oscillograph screen and the beat due to the superposition of the gauge pulse and the pulse from the sample are eliminated by a new method suggested here: the acoustic and measuring circuit units have separated start-up (Fig. 1). The arrangement works on 20 - 250 Mc. The synchronizing unit (1) triggers (with a frequency of 1 kc/s) the modulator (2), which produces rectangular pulses. These pulses start up the high-frequency generator (3). This generator sends r-f pulses to the quartz-emitter π_1 . The ultrasound pulses passing both through the liquid and through the quartz delay lines S_1 and S_2 , are converted by a

Card 1/2

On the problem of ultrasound...

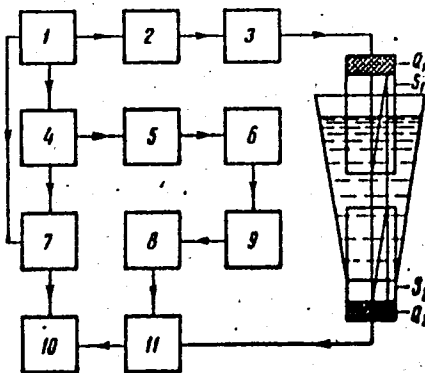
S/046/63/009/001/020/026
B104/B186

quartz receiver q_2 into r-f pulses. This signal is shown on the oscilloscope screen. The error of this method is 1 %. There are 3 figures.

ASSOCIATION: Fiziko-tehnicheskiy institut AN Turkmenskoy SSR, g. Ashkhabad
(Physicotechnical Institute AS Turkmenskaya SSR, Ashkhabad)

SUBMITTED: March 22, 1962

Fig. 1. Experimental arrangement.



Card 2/2

L 17985-63

ENT(1)/EMP(q)/ENT(m)/BDS AFFTC/ASD/APGC Pq-4 WH

ACCESSION NR: AT3002082

S/2728/62/008/000/0019/0048

AUTHORS: Berdy'yev, A. A.; Vasil'yeva, M. G.; Lezhnev, N. B. 65
64

TITLE: Investigation of the absorption of ultrasonic waves in several liquids

SOURCE: AN Turkmen SSR. Fiziko-tekhnicheskiy institut. Trudy, v.8, 1962, 19-48

TOPIC TAGS: ultrasonic wave , absorption, ultrasonic property liquids,
optical measurement, ultrasonic absorption, pulse method, ultrasonic absorption
measurement

ABSTRACT: The paper reports the results of experimental investigations of a pulse-type equipment for the measurement of the absorption of ultrasonic (US) waves in liquids within the frequency range from 5 to 200 mcps. The investigation generalizes the results of similar studies made over the past two years. The absorption investigations were performed by optical and pulse methods. The optical-measurement methods were based on the phenomenon of the diffraction of light passing through a medium in which US waves are propagating. The source and the equipment used in the present instance was a spherical extrahigh-pressure Hg quartz lamp, SVDSH-500, capable of operating in the frequency range from 5.0 to 34 mcps. The acoustic generator consisted of piezo-quartz platelets. The US

Card 1/3

L 17985-63

ACCESSION NR: AT3002082

waves were propagated vertically downward. The liquid investigated was placed in a vessel made of high-grade optical glass with plane-parallel walls. The bottom of the vessel was lined with glass wool to avoid the superposition of running and reflected waves in conditions of low absorption. The measurements were performed in monochromatic light. The measurement of the absorption of US waves was accomplished by a measurement of the brightness of the image of the US beam at various points. It was assumed that at the low acoustic amplitudes employed, the intensity of the diffracted light would be proportional to the square of the amplitude of the US oscillations. The brightness was measured by means of photographs taken on fine-grain photographic plates with uniform emulsion. All photographs were developed with the same type of developer under identical development conditions. Control measurements of the absorption coefficient in toluene showed that the error of the measurement did not exceed ± 7 percent. The overall scheme of the pulse equipment comprised a synchronization block, which, on the one hand, controls a sweep generator which at various sweep rates affords a measurement of the absorption for various lengths of the acoustic path, and, on the other hand, controls a modulator which, in turn, produces rectangular pulses which serve for the actuating of the high-frequency (HF) generator. The HF generator emits radio pulses which are delivered to the quartz radiator. The ultra-acoustic pulse thus obtained propagates in a delay line and, after passing

Card 2/3

L 17985-63

ACCESSION NR: AT3002082

through the test liquid, is again transformed into radio pulses by means of a quartz receiver. This signal subsequently is amplified in a RF receiver and delivered to an oscillograph. The absorption is determined by varying the thickness of the test liquid and measuring the resulting damping of the signal. The equipment operates on 12 fixed frequencies in the range from 5.5 to 200 mcps. The component electronic circuitry and the acoustic system employed are described. The investigation of the absorption of US waves in nonassociating mixtures (benzol, m-xylol, p-xylol, chloral) is investigated in detail, and it is found that: (a) The addition of a small quantity of weakly absorbing liquid to a strongly absorbing liquid decreases the absorption coefficient sharply; (b) an equation is developed on the basis of simplified considerations to explain and predict the observed sharp decrease in absorption coefficient in such circumstances; (c) the absorption coefficient increases linearly with the temperature. The investigation was also extended to the absorption coefficient of associating mixtures (methylalcohol, ethylalcohol, iso-amyl chloride), and an absorption maximum was found to exist in all the mixtures investigated. The presence of this maximum is explained by the formation of a new compound. Orig. art. has 10 numbered equations, 12 figures, 3 tables, and a 3-page electronic-parts list.

ASSOCIATION: none

SUBMITTED: 00

SUB CODE: AI, PH

Cd 3/3

DATE ACQ: 29Apr63
NO REF SOV: 002

ENCL: 00
OTHER: 000

LEZHNEV, N. D.

New technology and labor safety requirements. Zhel. dor. transp.
45 no.1:46-49 Ja '63. (MIRA 16:4)

1. Nachal'nik Glavnogo vrachebno-sanitarnogo upravleniya
Ministerstva putey soobshcheniya.

(Railroads—Safety measures)
(Industrial hygiene)

BERDIYEV, A.A.; VASIL'YEVA, M.G.; LEZHNEV, N.B.

Absorption of ultrasonic waves in some liquids.

Trudy fiz.-tekh. inst. AN Turk. SSR 8:19-48

'62.

(MIRA 15:11)

(Ultrasonic waves)

ACC NR: AP6016833

SOURCE CODE: UR/0046/66/012/002/0247/0250

AUTHOR: Berdyayev, A. A.; Lezhnev, N. B.

ORG: Physicotechnical Institute, AN Turkmenian SSR, Ashkhabad (Fiziko-tekhnicheskiy institut AN Turkmenskoy SSR)

TITLE: Method of investigation of acoustic properties of liquids at frequencies 300 - 1000 Mcs

SOURCE: Akusticheskiy zhurnal, v. 12, no. 2, 1966, 247-250

TOPIC TAGS: liquid property, acoustic property, acoustic equipment, cavity resonator, relaxation process

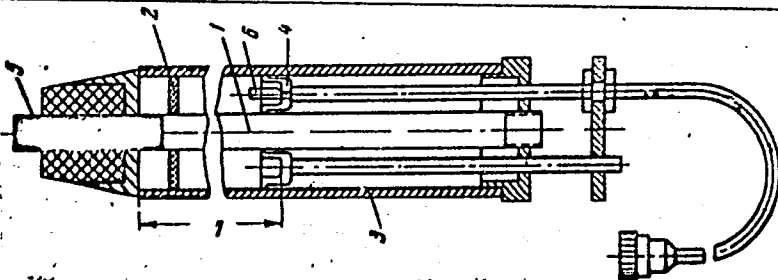
ABSTRACT: This is a continuation of earlier work by the authors on the absorption of ultrasound in organic liquids at high frequencies (Izv. AN Turkmenskoy SSR, ser. FTKh i GN, 1963, v. 3, 104-106). In view of the fact that the earlier high-frequency investigations were devoted either to the design of sound generators or to the use of high frequencies for investigation of solids, the authors have investigated the properties of liquids at frequencies above 300 Mcs. The experiment was based on the method of nonresonant excitation and reception of sound by piezoelectric quartz slabs and rods placed in coaxial resonators (Fig. 1). Some preliminary experiments made prior to the design of the resonator are described. The

Card 1/3

UDC: 534. - 8 + 532.12

ACC NR: AP6016833

Fig. 1. Diagram of final measuring element design. 1 - Central rod of resonator, 2, 3 - outer case of resonator, 4 - plunger, 5 - coupling loop



measuring equipment and the method were standard and described earlier (Akust. zh. v. 9, 113, 1963). New data were obtained for several liquids at 20C and 3 frequencies, as listed in the table:

| Substance | $a/f^2 \cdot 10^{-11} \text{ cm}^{-1} \text{ sec}^{-2}$ | | |
|----------------------|---|---------|---------|
| | 307 Mcs | 482 Mcs | 843 Mcs |
| Water | 24,7 | 23,8 | 24,2 |
| Toluene | 77,8 | 78,5 | 81,0 |
| Acetone | 27,2 | 24,1 | 23,6 |
| Benzene II | 755 | 495 | — |
| Thiophene | 775 | 469 | 160,0 |
| Methylene chloride | 349 | 177 | 78,2 |
| Chloroform | 365 | 310 | 246,0 |
| Carbon tetrachloride | 522 | 480 | 460,0 |

Card 2/3

ACC NR: AP6016833

The results indicate that relaxation effects occur at these frequencies in some of the liquids. The authors thank M. I. Shakhparonov, the late P. A. Bazhulin, and Ya. L. Gol'dfarb for supplying the liquid samples, and the VNIISTIS Research Institute for preparing the quartz rods. Orig. art. has: 3 figures and 1 table.

SUB CODE: 20/ SUBM DATE: 26Dec64/ ORIG REF: 008/ OTH REF: 009

Card 3/3

ZARIF'YANTS, Yu.A.; KISELEV, V.F.; LEZHNEV, N.N.; NOVIKOVA, I.S.; FEDOROV, G.G.

Synthesis and functional analysis of oxygen complexes on a surface of freshly cleft graphite. Dokl. AN SSSR 143 no.6:1358-1361 Ap '62. (MIRA 15:4)

1. Moskovskiy gosudarstvennyy universitet im. M.V.Lomonosova i Nauchno-issledovatel'skiy institut shinnoy promyshlennosti. Predstavleno akademikom M.M.Dubininym.
(Graphite) (Surface chemistry) (Oxygen compounds)

CA

N.N. LEZHNEV

Oxidation of the sodium butadiene polymer in the presence of phenyl 2-naphthylamine. A. N. Kuz'minskii and N. N. Lezhnev (Na) Research Inst. Higher Ind. Ministry Chem. Ind.). *Doklady Akad. Nauk S.S.S.R.* 60, 857-60 (1949); cf. C.A. 44, 1783. -- Introduction of phenyl 2-naphthylamine (I) stops the oxidation of the polymer at 120° and gives rise to a new induction period during which I is consumed, and at the end of which oxidation recurs; extr. of the inhibitor with MeOH suppresses the induction period. By both photocalorimetric and ultraviolet-absorption kinetic data, with a better than 5-12% agreement between the 2 methods, the rate of disappearance of I, added to 30-40% films of the polymer, was const. over the whole induction period of 21 min. From expts. with 60, 25, and 12.5 millimoles/l. polymer at 120°, and with a const. 12.5 millimoles at 100, 110, 120, and 130°, the rate of consumption of I is independent of its initial concn. but increases with the temp. If the action of I consists in a reaction with the active centers produced by addn. of O_2 or HO_2 , thus, rupture of the chains, the rate of that step is $-dI/dt = k_1 b$, where b = concn. of I, a = concn. of the active centers produced by $O_2 + O_2 \rightarrow a$ (where a = polymer), at the const. rate $+da/dt = k_2$. The constancy of the rate of consumption of I means $k_1 = k_2 b$, i.e. the concn. of the active centers a is at any moment inversely proportional to the concn. b of I. If, in analogy to the slow oxidation of hydrocarbons, the rate of the chain process W is, according to Medvedev and Pod'yapol'skaya (C.A. 34, 7767), the sum of the rate W_1 of the process due to activation of the initial substance, and the rate W_2 of the process proceeding over peroxides, then evidently, $W_1 = k_1$, and, if the total W is detd. by the exptl. consumption of O_2 , it is possible to calc. W_2 , which, on the other hand, is $W_2 = k_2 [P] [P]$, where P = peroxide. The chain length being $\gamma = W/(-da/dt)$, it is, for the 1st process, $\gamma_1 = W_1/k_1 = 1$, during the induction period. Exptl. values of the consts. (in mol./l. sec.) for the Na butadiene polymer, are, at 90 and 100°, $10^6 W = 0.90$ and 1.61 , $10^6 W_1 = 0.13$ and 0.20 , $10^6 W_2 = 0.90$ and 1.61 , $10^6 k_1 = 0.13$ and 0.20 , $10^6 k_2 =$

0.043 and 0.119. Rates of initiation of the polymer in the induction period, at 90, 100, 110, 120, and 130°, are 0.13, 0.20, 0.64, 2.64, and 4.70 ($\times 10^{-3}$). The activation energy in that temp. interval is 22.5 kcal. N. Thon

LEZHNEV, N.N.

✓ 2092 Influence of oxygen upon rubber aging

4

ECUATION of the process of oxidation and its results: a) the influence of diffusion upon the rate of the oxidation of unvulcanized and vulcanized rubbers; b) the connection between the rates of initiation and of the change in physical-mechanical properties of vulcanizates; c) the dependence between the action of one or several inhibitors and

Kinetics of oxidation of sodium butadiene polymer in the presence of phenyl beta-naphthylamine. A. S. KUT'KINSKY AND N. N. KUZNETSOV. Zhur. Fiz. Khim., 1960, 36, 630-641; Chem. Abs., 1962, 56, 9181. Films were made from mixed benzene solutions of the rubber, free of anti-oxidants, and phenyl beta-naphthylamine, and kept in oxygen at 7°C. for film. The amount p of unchanged amine was determined in the methyl alcohol extract of the film. The bound amine was determined in the rest of the film. Decrease of p with increase of t was almost linear and independent of amine concentration in the film initially. The induction period of oxidation ended when p was almost zero. The amount of bound amine in the part A (benzene insoluble) of the film increased with t at the same rate as p .

3-2121 3233

Structure of rubbers and their reactivity. A. S. Kuz'minskii and N. N. Lezhnev. *Doklady Akad. Nauk S.S.S.R.* 70, 1021-4 (1959).—By detns. of the rates of autooxidation in O_2 of a gutta-percha hydrocarbon (I), natural rubber hydrocarbon (II), butadiene-styrene rubber (III), a butadiene rubber with 80% double bonds in the main chain (IV), and a butadiene rubber with 20% double bonds in the main chain (V), the consumption of the inhibitor, phenyl- β -naphthylamine, added in the initial amt. of 12.5 millimoles/mole rubber, is a linear function of the time, i.e., the rate is const., and decreases in the above order. The rates of the autocatalytic fixation of O_2 after consumption of the inhibitor follow the same order. Consequently, the oxidizability of a rubber is detd. not by the length of the mol. chain, spatial configuration, or presence of aromatic rings, but solely by the no. of double bonds in the principal chain. The rate of consumption of inhibitor corresponds to the rate of the primary act of initiation of oxidation. Rates (w) and rate const. (k) of the initiation, calcd. from the inhibition rate data, at 120 and 130°,

are: (I) $10^3 w = 10.10$ and 20.01 , $10^3 k = 177.2$ and 354.0 ; (II) 10.01 and 20.31 , 170.1 and 357.3 ; (III) 8.70 and 18.27 , 122.8 and 257.3 ; (IV) 8.10 and 18.20 , 112.5 and 256.3 ; (V) 2.34 and 4.70 , 33.0 and 60.0 . At any temp., w or k is a linear function of the double-bond content in the principal chain. This influence predominates over the possible effects of all other factors; in particular, the mol. wt. or the configuration seems to play no role. The activation energy for the binding of O_2 by a double bond of the principal chain is 21.3 kcal. per mole for all the rubbers investigated. Double bonds in the side chains are practically inert during the stage of consumption of inhibitor, and undergo some oxidation only at the stage of autocatalytic union of O_2 , with an activation energy of 26.8 kcal. per mole. For the nearly satd. Butyl rubber, the rate of consumption of inhibitor is represented by a broken line. Initially, the mol. reacts with O_2 faster at simple than at double bonds; as soon as a const. mol. wt. is attained, oxidation proceeds at a slower rate mainly at the double bonds of the principal chain. Apparently long chains react earlier than short chains. In all cases, double bonds in the principal chain are considerably more reactive than

in the side chains. This applies not only to reaction with O_2 , but also with ozone and inorg. acids. N. Thon

Sov. Res. Inst. Rubber Industry

log 61

Polymers from the

1960

Mechanical activation of rubbers (oxidation under mechanical stress). A. S. KUBNINSKY, N. N. LEZHNEV, and M. G. MAIERL. *Doklady Akad. Nauk S.S.S.R.*, 1960, 71, 310-22; *Chem. Abs.*, 1960, 44, 6660. Oxidation of vulcanised butadiene-styrene copolymer 84.6%, Thiols 3%, zinc oxide 1%, and phenyl-beta-naphthylamine (inhibitor) 0.6%, subjected to alternating stresses of 60% amplitude at 200 c./min., proceeds at the induction stage of consumption of the inhibitor at a constant rate which is greater than the rate of purely thermal inhibited oxidation at the same temperature. The theory of the activation energies of the processes is considered. The effect of fatigue in the presence of oxygen is to reduce the number of cycles before rupture as compared with the number needed at the same temperature in the presence of nitrogen; thus at 30°, 40°, 60°, 80°, and 100° C. the figures were respectively in oxygen 80, 45, 20, 7, and 2 and in nitrogen 140, 120, 200, 125, and 210.

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OTR

7992* The Aging of Latex and Vulcanization. (In Russian.) A. S. Kuzminskii and N. N. Lezhnev. *Legkaya Promyshlennost*, v. 11, Nov. 1951, p. 25-28. Influence of several factors on the above. Graphs.

LEZHNEV N. N.

10

Diffusion of oxygen and oxidation of rubber in the presence of phenyl-2-naphthylamine. A. S. Kuz'minkii, L. L. Shanin, and N. N. Lezhnev (Nauch-Issledovatel. Inst. Rezinov oi Prom. MKhP. S.S.S.R.) Doklady Akad. Nauk - S.S.S.R. 79,467-70(1951).--Under const. O_2 pressure P_0 , the rate of oxidation (measured by the rate of consumption of the antioxidant phenyl-2-naphthylamine) of films of Na butadiene rubber 30-40 μ thick is const. With varying P_0 (10-760 mm.), the rate w of the inhibited oxidation increases approx. proportionally to the square root of the concn c of dissolved O_2 , $w = k_1 c^{\frac{1}{2}}$. The rate of oxidation $w = f(c)$ and the diffusion coeff. D of the dissolved O_2 are _____ by D (_____) $= (\partial c / \partial t) + w$, where x = distance from the middle of the film. In the case of inhibited oxidation, D can be considered const. Solution of the above partial differential equation is difficult because the right-hand member is not linear. In its stead, the linear equation $D(\partial^2 c / \partial x^2) = (\partial c / \partial t) + k_2 c$, is solved, with k_2 detd. from the condition that the algebraic sum of the deviations of the approx. rate $k_2 c$ from the actual rate $k_1 \sqrt{c}$ in the concn. range from zero to c should be zero. This gives, at 120° , $k_2 = 8.15 \times 10^{-5} \text{ sec.}^{-1}$. Solution of the linear equation gives c as a function of x and t . In a film 1 cm. thick, with both sides exposed to oxidation, stationary distribution of O_2 over the thickness is established, at 120° , in 14 hrs., and in a film 0.1 cm. thick in 10-15 min. Practically, on account of the actual dependence of the rate on $c^{\frac{1}{2}}$ (rather than on c), stationary distribution is attained somewhat later. It can, however, be concluded that all-

LEZHNEV, N. N.

4

Inhibited oxidation of rubbers. A. S. Kuz'minskii and N. N. Lezhnev. *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady 7-oi Konf. Vysokomolekul. Soedinenii* 1952, 90-8. The initiation of inhibited oxidation of rubbers is detd. by the disappearance of *N*-phenyl-2-naphthylamine (N according to Kjeldahl). The initiation reaction of this inhibited oxidation has an activation energy of 22.6 cal./mole for any polymer which does not contain electroneg. groups. The reactivity of the polymers to oxidation depends on the concn. of double bonds. The degree of polymerization, configuration of the chains, presence of aromatic rings, etc., have practically no influence on this rate. The reaction of O with double bonds in the side chains of butadiene rubbers has an activation energy of 27-8 cal./mole. The oxidation of polyisobutylene in the presence of *N*-phenyl-2-naphthylamine has a temp. threshold below which initiation does not take place. The inhibited oxidation of Butyl rubber is shown by oxidation of the polymer chains and addn. of O to the double bonds.

H. D. Noether

LAZHEV, N. N.

(4)

Mechanical activation of the initiation of oxidation of rubbers. A. S. Kuz'minskii, M. G. Maizel's, and N. N. Lazhev. *Khim. i Fiz.-Khim. Vysokomolekul. Soedinenii, Doklady i ot. Konf. Vysokomolekul. Soedineniyam*. 1952, 99-107. — The effect of mech. activation (extension of rubber by 50% of its original length at 250 cycles/min.) on the inhibited oxidation of vulcanized and unvulcanized rubbers was detd. The activation energy of butadiene rubber to inhibited oxidation at 70-80° during mastication drops from 22.6 to 8.46 cal./mole, the activation energy of vulcanized butadiene-benzene rubber on mech. stretching (250 cycle/min.) at 123-143° drops from 21.0 to 18.1 cal./mole. At the same time the pre-exponential factor of the Arrhenius equation decreases. The destructive effect is due to the presence of O₂ since, in a N atm. at 20, 60, and 100°, the rubber is 2, 10, and 105 times as stable, resp., than with O₂ present.

H. D. Noether

LEZHNEV, N. N.

PA 234T7

USSR/Chemistry - Rubber, Vulcanization Accelerators 1 Mar 52

"The Joint Influence of Phenyl-beta-naphthalamine, Sulfur, and Vulcanization Accelerators on the Oxidation of Rubber," A. S. Kuz'minskii, M. N. Lezhnev, Sci Res Inst of Rubber Production

"Dok Ak Nauk SSSR," Vol 83, No 1, pp 111-114

Sulfur and vulcanization accelerators have a great effect on the oxidation processes of rubber. These processes in turn have a great effect on the mech properties of the rubber.

234T7

Phenyl-beta-naphthalamine and sulfur were tested on sodium-butadiene rubber and curves showing the rate of consumption of each were plotted. It was shown that sulfur is consumed faster than phenyl-beta-naphthalamine. Presented by Acad P. A. Rebinder 11 Jan 52.

234T7

USSR/Chemistry - Synthetic Rubber

21 Oct 52

"The Connection Between Oxidation and Change in Structure of Butadiene-Styrene Rubber," N. N. Lezhnev, A. S. Kuz'minskiy, Sci Res Inst of Rubber Ind, Min of Chem Ind USSR

"Dok Ak Nauk SSSR" Vol 86, No 6, pp 1147-1150

A theoretical curve was calcd for the change in elasticity during oxidation at 100° of heat-vulcanized butadiene-styrene rubber contg 1/4 phenyl-beta-naphthalamine. Exptl data fit the curve satisfactorily and thus a connection is established between the chem

process based on the decomn of active peroxide and the change in mech properties during the oxidation of rubber. Presented by Acad P. A. Rebinder 15 Aug 52.

LEZHNEV, N. N.

234T83

LEZHNEV, N. N.

(3)
✓ Simultaneous effects of phenyl-β-naphthylamide, sulfur,
and vulcanization accelerators on the oxidation of rubber.
A. S. Kur'minskii and N. N. Lezhnev (Scientific Research
Inst. Rubber Ind., Moscow). Rubber Chem. & Technol. 26,
352-5 (1953).—See C.A. 46, 8887i.

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Ref. 17.3

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determination of the equilibrium modulus of rubber
and for relaxation and creep testing, it is proposed
to use, instead of the dynamometer, sup-
porting frames MR1 and MR2 ("modulus frames"),
using static loading and weight loading respectively

154

LEZHNEV, N. N.

5

Inhibited oxidation of elastomers. A. S. Kuzminsky and
N. N. Lezhnev (Sci. Research Inst. Rubber Ind., Moscow).
Rubber Chem. and Technol. 28, 212-19 (1955) (in English).
See C.A. 48, 8573i. C. C. Davis

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MST

LEZHNEV, N.N.; KUZ'MINSKIY, A.S.

Influence of the chemical nature of carbon black on the properties of thermovulcanizates of the divinylstyrene polymers.
Dokl.AN SSSR 110 no.1:108-111 S-O '56. (MLRA 9:11)

1. Nauchno-issledovatel'skiy institut resinovoy promyshlennosti.
Predstavleno akademikom P.A.Rebinderom.
(Carbon black) (Rubber, Synthetic)

LEZHNEV, N. N.

Call Nr: AF 1154947

AUTHORS: Kuz'minskiy, A.S., Lezhnev, N.N., Zuyev, Yu.S.
TITLE: Oxidation of Natural and Vulcanized Rubbers (Okisleniye kauchukov i rezin)
PUB.DATA: Gosudarstvennoye nauchno-tekhnicheskoye izdatel'stvo khimicheskoy literatury, Moscow, 1957, 319 pp., 5,000 copies
ORIG.AGENCY: None given
EDITORS: Babushkina, S.I.; Tech. Ed.: Lur'ye, M.S.
PURPOSE: The monograph is intended for scientific and engineering personnel of the rubber industry, and for specialists in allied fields of chemical technology.

Card 1/10

Call Nr: AF 1154947

Oxidation of Natural and Vulcanized Rubbers (Cont.)

COVERAGE: The book discusses aging of natural and vulcanized rubbers caused by oxygen, ozone, high temperature, light, mechanical stress and catalysts. Methods of studying aging and prevention of aging are reviewed. Personalities mentioned include: Angert, L.G., Belitskaya, R.M., Degteva, T.G., Lyubchanskaya, L.I., Mayzel's, M.G., Peschanskaya, R.Ya., Popova, Ye.B., Postovskaya, A.F., Khitrova, N.G., Shemastina, Ye.V., Shokhin, N.A., Shanin, L.L., Kargin, V.A., Medvedev, S.S., Dogadkin, B.A., Dolgoploskiy, B.A., Rebinder, P.A., Slonimskiy, G.L., Bartenev, G.M., Abkin, A.D., Reytlinger, S.A. There are 42 references, 19 USSR, 20 English, 2 German, 1 French. There is a bibliography at the end of each chapter.

Card 2/10

Oxidation of Natural and Vulcanized Rubbers (Cont.) Call Nr: AF 1154947

TABLE OF CONTENTS

| | |
|---|----|
| Preface | 5 |
| Introduction | 7 |
| Bibliography | 12 |
| Ch. I Thermal Oxidation of Natural and Vulcanized Rubbers | 13 |
| 1. General considerations | 13 |
| 2. Effect of high temperature on natural and vulcanized rubbers | 22 |

Card 3/10

Oxidation of Natural and Vulcanized Rubbers (Cont.) Call Nr: AF 1154947

3. Structure of natural rubbers and their reactivity to oxygen 28
4. Free (autocatalytic) oxidation of natural rubber 35
5. Oxidation of natural rubber in solutions 53
6. Oxidation of natural rubbers in the presence of antioxidants 55
7. Oxidation of natural rubbers in the presence of various ingredients of vulcanized rubber mixtures 76
8. Oxidation of vulcanized rubbers 89
9. Catalytic oxidation of natural rubbers under the action of metals of alternate valency 100

Card 4/10

Oxidation of Natural and Vulcanized Rubbers (Cont.)

10. Action of various oxidizers on natural rubber 110

Bibliography 113

Ch. II Aging of Natural and Vulcanized Rubbers by Air (Aging by Light) 118

1. General considerations 118
2. Oxidation by light 125
3. Effect of light on various natural rubbers 142
4. Role of rubber-mixture ingredients in the action of light on natural and vulcanized rubbers 145

Card 5/10

Call Nr: AF 1154947

Oxidation of Natural and Vulcanized Rubbers (Cont.)

5. Protection of vulcanized rubbers from the effect of light 153

Bibliography 163

Ch. III Aging of Natural and Vulcanized Rubbers by Air (Effect of Ozone and Light and Ozone) 168

1. General considerations 168
2. Effect of ozone on undeformed natural and vulcanized rubber 171
3. Effect of ozone on deformed vulcanized rubber 173
4. Structure of natural rubber, its chemical resistance to ozone and cracking ozone 180

Card 6/10

Call Nr: AF 1154947

Oxidation of Natural and Vulcanized Rubbers (Cont.)

5. The role of some ingredients in cracking of rubber by ozone 183

6. Combined action of light and ozone on vulcanized rubber 186

7. Increase of vulcanized rubber resistance to cracking by ozone 193

Bibliography 200

Ch. IV Oxidation of Vulcanizates subjected to Mechanical Stress 204

Bibliography 218

Card 7/10

Oxidation of Natural and Vulcanized Rubbers (Cont.) Call Nr: AF 1154957

Ch. VI Methods of Testing the Aging of Natural and Vulcanized Rubbers 250

1. Chemical methods of testing 251

2. Mechanical methods of testing 260

3. Methods of accelerating aging of rubber 278

Bibliography 294

Card 9/10

Oxidation of Natural and Vulcanized Rubbers (Cont.) Call Nr: AF 1154957

Ch. VII Oxygen Diffusion and Solubility in Natural and Vulcanized Rubbers 298

1. Oxygen solubility in natural and vulcanized rubbers 298

2. Oxygen diffusion in natural and vulcanized rubbers 303

3. Solubility of ingredients in rubbers 310

4. Oxygen diffusion and kinetics of rubber oxidation 314

Bibliography 318

AVAILABLE: Library of Congress

Card 10/10

5(4)

SOV/63-4-3-23/31

AUTHORS: Lezhnev, N.N., Nikitina, T.S., Kuz'minskiy, A.S.

TITLE: On the Modification of the Surface of Carbon Blacks by the Action of Ionizing Radiation

PERIODICAL: Khimicheskaya nauka i promyshlennost', 1959, Vol 4, Nr 3, pp 407-408 (USSR)

ABSTRACT: The strengthening effect of carbon black is determined by the adsorption properties of its particles. The surface may be modified by radio-chemical addition of various compounds. The irradiation was carried out by a Co⁶⁰ source of 22,000 g-equ. Phenyl- β -naphthylamine, mercaptobenzothiazol, sulfur and rubber of the type SKS-30A were physically adsorbed. The mechanical properties of the vulcanizates were studied on the Polani dynamometer. A considerable effect is obtained by irradiating carbon black with rubber chemically adsorbed on its surface.
There are 2 tables.

Card 1/2

SOV/63-4-3-23/31

On the Modification of the Surface of Carbon Blacks by the Action of Ionizing Radiation

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti (Scientific Research Institute of the Rubber Industry)

Card 2/2

5(4)

SCV/20-125-5-29/61

AUTHORS:

Kuz'minskiy, A. S., Zaytseva, V. D., Lezhnev, N. N.

TITLE:

On the Suppression of the Catalytic Effect of Polyvalent Metals in Rubbers (O podavlenii kataliticheskogo deystviya polivalentnykh metallov v kauchukakh)

PERIODICAL:

Doklady Akademii nauk SSSR, 1959, Vol 125, Nr 5, pp 1057 - 1060 (USSR)

ABSTRACT:

The suppression of the catalytic effect of polyvalent metal ions contained in rubbers is an important, though hitherto little investigated problem. This gap is partly filled by the present paper. The behavior of metal salts was investigated in divinyl-styrene rubber as well as in natural rubber. The authors determine the rate at which oxygen is absorbed by rubber at various temperatures and the variation of rubber structure from the viscosity of its solution in benzene. The results obtained by these investigations are shown by 3 diagrams. It was found useful to investigate the binding of metal ions to stable, catalytically inactive complexes. These complexes (which are apparently formed by an electron of the

Card 1/4

On the Suppression of the Catalytic Effect of
Polyvalent Metals in Rubbers

SOV/20-125-5-29/61

d-layer of the Cu^{++} -ion or by 5 electrons of Fe^{+++} and Mn^{++} not joined in pairs) show a complete blocking of the central ion by the molecules of the addend, so that transition of the electrons from this ion to the substratum (peroxide of rubber) or vice versa becomes impossible. The first part of the present paper deals with the ability of metal salts to form complex compounds with the various ingredients of rubber mixtures, viz. in low-molecular compounds and in the rubber substance. The binding of the copper ion by the antioxidant in the benzene solution was investigated by observing the fluorescence of the solution of these substances in benzene and alcohol. The conditions warranting the complete extinction of fluorescence are given by a table. As the extinction of fluorescence may be brought into connection with the blocking of the ion, it indicates a decrease of the possibility of a valence transition and consequently a decrease of the catalytic activity of the metal ion. The authors then investigated the possibility of the formation of the aforementioned complex compounds in the rubber substances. The

Card 2/4

On the Suppression of the Catalytic Effect of
Polyvalent Metals in Rubbers

SOV/20-125-5-29/61

compounds of iron and rubber with certain components of rubber form stable complex compounds, which may be obtained by the precipitation of acid or basic aqueous solutions from them. The components which had not participated in the reaction must then be carefully washed out. The composition of these compounds is shown by a table. The relations of the molecules of organic compounds to the metal atoms, as shown in these tables, can in most cases not be represented in form of a definite structure, and therefore this problem is in need of further investigation. The reaction between the complex-former and the metal in the rubber medium develops completely but slowly. 3 diagrams contain data concerning the kinetic oxidation of rubber in the presence of complex compounds (formed immediately in the carboniferous medium of the rubber), and also concerning the synthesized complex compounds introduced into a rubber. The bound metal ions exercise no influence whatever upon the rate of oxidation or upon the structural variation of rubber, i.e. they lose their catalytic activity. Therefore, rubbers able to form

Card 3/4

On the Suppression of the Catalytic Effect of
Polyvalent Metals in Rubbers

SOV/20-125-5-29/61

complex salts with the ions Cu^{++} , Fe^{+++} , etc have a greater stability with respect to the salts of polyvalent metals than the rubbers used for their production. There are 3 figures, 2 tables, and 6 references, 1 of which is Soviet.

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy (Scientific Research Institute for Rubber- and Latex-Products)

PRESENTED: January 3, 1959, by P. A. Rebinder, Academician

SUBMITTED: December 22, 1958

Card 4/4

S/138/61/000/011/005/007
A051/A126

AUTHORS: Lezhnev, N. N., Terent'yev, A. P., Novikova, I. S., Kobzeva, T. A.

TITLE: The chemical nature of the surface of carbon black

PERIODICAL: Kauchuk i rezina, ²⁰no. 11, 1961, 21 - 27

TEXT: The authors have developed a new method for the quantitative determination of certain oxygen functional groups present in carbon black, and have tested the validity of methods previously used. A rapid and accurate method for the determination of active hydrogen in carbon blacks, using an ether solution of the Grignard reagent, was also developed, in addition to a method for the alkalimetric titration of the acidic groups of the carbon blacks with caustic soda and sodium carbonate. By assuming that the caustic soda reacts with all the acidic groups and the sodium carbonate only with the carboxylic ones, the phenol and carboxylic groups in the carbon blacks were determined. The general nitrogen in the carbon black was determined by the Kjeldahl method. The latter is a variation of the method introduced by A. P. Terent'yev and B. M. Luskiniy. Combustion can be carried out in 4 hours, and chromic acid is used as the oxidation catalyst. Conclusions are drawn on the nature of the oxygen bound with certain carbon blacks

Sard 1/3

S/138/61/000/011/005/007
A051/A126

The chemical nature of the surface of carbon black

from the developed methods and by comparing the obtained results with data of other non-Soviet authors, and data of carbon black investigation using the paramagnetic electron resonance method. However, a large portion of the oxygen in the channel black has not been identified. The most complete identification of oxygen was made for that bound with experimental carbon black of the $\text{XA}\Phi$ (KhAF) type. Data of the channel black analysis, both of the initial and of that containing chemically adsorbed neozone II (D), Φ 2 HA (F2NA) and also captax MET (MBT) led to the assumption that these substances react with oxygen-containing radicals of carbon black at the position of the weakest-bound hydrogen atom (RN-H and RS-H). It is pointed out that carbon black chemically interacts with various ingredients of rubber and probably with raw rubber or polymer radicals. Thus, the following are thought to be chemically active: 1) various oxygen-containing groups, 2) sulfur-containing compounds - in the case of carbon blacks, produced on the basis of petroleum and coal, 3) free radicals on the surface - non-coupled electrons of atoms of carbon and oxygen and possibly atoms of sulfur and nitrogen, bound by chemical bonds with carbon atoms of the carbon black crystalline lattice. The sulfur-containing groups are thought to have the structure $>\text{C}=\text{S}$ and $\rightarrow\text{C}-\text{SH}$. The active hydrogen is thought to be in the groups - $\text{C}^{\text{O}}_{\text{O}}-\text{H}$ and $\rightarrow\text{C}-\text{O}-\text{H}$. Re-

Card 2/3

The chemical nature of the surface of carbon black

S/138/61/000/011/005/007
A051/A126

sults obtained clarified the mechanism of interaction between the carbon black and accelerators of vulcanization and anti-oxident of the secondary aromatic amine type. A satisfactory correlation is derived in a comparison of the theory of polymerization and hydrocarbon oxidation with two cases investigated by the authors: Channel black processed with MBT; channel black processed with F2NA. There are 2 tables, 1 figure and 14 references: 6 Soviet-bloc and 8 non-Soviet-bloc. The references to the 3 most recent English-language publications read as follows: H. V. Drushel, J. V. Hallum, J. Phys. Chem., 62, no. 1, 110 (1958); G. Kraus, R. L. Collins, Rubb. World, 139, 219 (1958); M. Beroza, Analyt. Chem., 25, 177 (1958).

ASSOCIATION: Nauchno-issledovatel'skiy institut shinnoy promyshlennosti (Scientific Research Institute of the Tire Industry)

Card 3/3

37277

S/138/62/000/004/004/008
A051/A126

15.9130

AUTHORS:

Kuz'minskiy, A.S.; Zaytseva, V.D.; Lezhnev, N.N.

TITLE:

Protection of natural and synthetic rubber from catalytic oxidation under the action of copper and iron ions

PERIODICAL:

Kauchuk i rezina, no. 4, 1962, 10 - 14

TEXT:

A study was made of the causes for the different effects of ingredients on the catalytic oxidation of NR (smoked sheets) and CKC-30A (SKS-30A) in the presence of iron and copper. It is assumed that metals with changing valencies can speed up both the reaction of initiation as well as that of chain development. The reaction which determines the rate of initiation is the decomposition of hydroperoxide under the effect of metals. The authors discuss the activation of oxygen and the formation of active intermediate compounds of metal ions with oxygen. The possibility of repressing the accelerated oxidation of NR and SKS-30A in xylene solutions and the solid state was investigated by binding the metal ions into catalytically inactive complexes. Certain rubber ingredients served as the addends in the complexes. Obtained data led to the following conclusions: 1) the higher the concentration of the metal ions in the rubber solution, the faster its viscos-

Card 1/3

Protection of natural.....

S/138/62/000/004/004/008
A051/A126

ity drops; 2) the catalytic activity of the copper ions with respect to the rubber oxidation is much higher than the catalytic activity of the iron ions; 3) certain ingredients introduced into the rubber mix have the ability, partly or completely, to suppress the catalytic activity of the copper and iron ions. A further study was made of the catalytic oxidation in the rubber solutions in the presence of anti-aging agents containing amino- and hydroxyl groups, of accelerators containing sulfur and an amino- group in the molecule, and of a vulcanizing agent. The following conclusions were drawn: the accelerators of vulcanization (tetramethylthiuramdisulfide, sodium diethyldithiocarbamate) and anti-aging agents (n-oxyphenyl- β -naphthylamine, dinaphthyl-n-phenylendiamine, dioxydiphenylamine), form firm compounds with the metal ions of varying-valency metals, not having any catalytic activity with respect to natural and synthetic rubbers, but characteristic of the metal ions themselves. These compounds most probably have the structure of intercomplex slats. Certain complex compounds, formed by the metal ion of varying valency, and deactivating substances, are strong inhibitors of rubber oxidation. A new method for synthesizing effective inhibitors is recommended. There are 5 figures and 1 table. The reference to the most recent English-language publication reads as follows: 9.A.Martell, M. Calvin, Chem. of the Metal

Card 2/3

Protection of natural.....

S/138/62/000/004/004/008

A051/A126

Chelat Compound (1952).

ASSOCIATION: Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti i
Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy.
(Scientific Research Institute of the Rubber Industry and Scientific
Research Institute of Rubber and Latex Articles)

Card 3/3

KUZ'MINSKIY, A.S.; ZAYTSEVA, V.D.; LEZHNEV, N.N.

Protecting crude and vulcanized rubbers from catalytic oxidation
under the effect of copper and iron ions. Kauch. i rez. 21
no.4:10-14 Ap '62. (MIRA 15:4)

1. Nauchno-issledovatel'skiy institut rezinovoy promyshlennosti i
Nauchno-issledovatel'skiy institut rezinovykh i lateksnykh izdeliy.
(Rubber) (Oxidation)